HEC Supplement / SRH's External Load Operations Manual
Supplement A

Definitions

Secondary safety – A device, such as a Personal Safety Device (PSD) or approved secondary hook installation is intended to protect the external crewmember from an inadvertent release from the aircraft's primary attachment means.

Sufficient experience – Means sufficient training, knowledge, skills, proficiency, and experience to recognize foreseeable hazards and to take appropriate mitigation measures to manage and minimize risks.

Safety Management System (SMS) – SMS can be defined as a coordinated, comprehensive set of processes designed to direct and control resources to manage safety. SMS takes unrelated processes and builds them into on coherent structure to achieve a high level or safety performance, making safety management an integral part of overall risk management. SMS is based on leadership and accountability. It requires proactive hazard identification, risk management, information control, auditing, and training. It also includes incident and accident investigation and analysis.

Personal Safety Device (PSD) – A PSD, also known as a belly band system, or emergency anchor, is used in helicopter external-load operations involving Class B HEC. This type of PSD is typically a strap that extends through the aft cabin doors around the helicopter's flooring and belly. It hangs beneath the helicopter between the landing hear and is to serve as a secondary safety means of attachment for the external crewmember. The PSD is intended to improve human external cargo safety by reducing the chance of an accidental cargo discharge in case the primary attaching means or release system fails.

Crewmember – Individual that has completed the appropriate training and has demonstrated understanding and proficiency in general helicopter safety and Class B HEC operations; and performs an essential function in connection with the external-load operation; or is necessary to accomplish the work activity directly associated with that operation.

Competent Person – Is one who, by way of training and/or experience, is capable of identifying existing and predictable hazards relating to the specific operation in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to a person, and who has the authority to take prompt corrective measures to eliminate them.

Primary Attachment Means – Is the point at which the external load is connected to the helicopter (FAA approved Cargo Hook).

Description

The helicopter short-haul technique was originally researched and developed by Swiss Air Rescue (REFA) in 1966. Class B HEC gained popularity in Europe prior to 1970 as an effective rescue technique in mountainous areas. In 1970, National Parks Canada incorporated class B HEC (slinging) into their search and rescue program, where it continues to be widely used.

In the early 1980's, Class B HEC was adopted and modified by various agencies as well as the utility industry for use in a variety of missions and tasks. Helicopter shorthaul continues to be an effective tool in meeting safe and efficient operational objectives within these programs. The regulation, 14 CFR Part 133.35, allows a person to be carried during rotorcraft external-load operations when that person:

1. Is a flight crew member;
2. Is a flight crewmember trainee;
3. Performs an essential function in connection with the external-load operation;
4. Is necessary to accomplish the work activity directly associated with the operation.

Application

Class B HEC has become an essential tool within the power utility industry and has proven to be a safe and efficient means of conducting numerous tasks. Pilots and operators should conduct a thorough safety analysis of any proposed CLASS B HEC operation to ensure that the use of Class B HEC is appropriate to the mission and that a proper hazard analysis has been conducted.

Minimum Standards

Each crewmember shall have a complete understanding of their roles and responsibilities, a willingness to perform the work, and have the proper attitude towards safety standards and procedures. The minimum qualifications outlined herein are intended to help identify those individuals with sufficient past experience that may be considered a candidate for Class B HEC operations.

Pilot Qualifications

Helicopter pilots selected to perform Class B HEC operations should have past experience within the power utility industry and be trained for safe operations within the wire environment. A PIC shall have a minimum of the following:

- 2,000 hours of PIC in helicopters
- 500 hours of vertical reference long line experience
- 200 hours as PIC in make/model to be used in Class B HEC operation
- 200 hours as PIC conducting precision vertical reference, long line operations
- Knowledge of the electrical hazards and "hands on" work to be conducted
- Fitness for duty and physical or psychological limitations
- Good communication skills
- Positive attitude and aptitude
- Flight operation hazards within the wire environment, documented training < 3 years

Crew Member Qualifications

Not all crewmembers will be comfortable with or qualified to perform Class B HEC work. All crewmembers should be selected for CLASS B HEC work on a voluntary basis. Crewmembers selected should be qualified for CLASS B HEC operations based on:

- Experience level
- Knowledge of aircraft limitations including weight limitations for power margins
- Knowledge of "hands on" work to be conducted
- Fitness for duty and physical or psychological limitations
- Good communication skills
- Positive attitude and aptitude

Training

Thorough training of both pilots and crewmembers is critical to safely conducting CLASS B HEC operations. The following topics are covered in the SRH's HEC Training Program.

- General Helicopter Safety Training
- Regulations
    - Each pilot and crewmember should be aware of the applicable regulations appertaining to Class B HEC operations
    - Company and aircraft specific requirements and limitations

Pilot Training

Only pilots that have demonstrated a sufficient level of experience, skill, and ability within Class B vertical reference operations will become HEC qualified. All HEC training will be conducted by the chief pilot or a qualified designee. Pilot training should be conducted and documented in accordance with SRH's HEC training program and should contain, but is not limited to, the following minimum curriculum:

- Knowledge and skill training in accordance with 14 CFR 133.37
- Demonstrated proficiency with precision vertical reference load placement
- Proper load configuration, use, and application of Class B HEC
- Installation, inspection, and operation of secondary safety device(s)
- Acceptance or rejection criteria of HEC long lines, connecting devices, and/or harnesses
- Risk analysis and mitigation
- Crew resource management (CRM)
- Communication
- Normal/abnormal and emergency procedures pertinent to Class B HEC operations
- Electrical wire environment hazards
- Fuel Management

Crewmember Training

Crewmembers working on or around the helicopter should be trained by a competent person in the following areas:

- Task specific operations
- Equipment, inspections, acceptance or rejection criteria of HEC long lines, chairs, and/or harnesses.
- Risk analysis and mitigation
- Crew resource management
- Communication
- Emergency procedures pertinent to Class B HEC operations
- Ground
- Flight
- Mock up training and review of:
    - Rigging inspection, acceptance, or rejection criteria of equipment
    - Communication procedures
    - Simulation of task (both crew and pilot tasks)
- Documentation completed proficiency on all of the above

Each crewmember or utility is responsible to ensure that the individuals providing crewmember training have sufficient experience with Class B HEC operations and safe rigging. Additionally, competent instructors should have working knowledge and understanding of the particular risks associated with the specific project being conducted.

Currency

Recurrent training is required annually. Pilots shall document all HEC in their logbook. An HEC pilot shall maintain HEC currency at the rate of at least 10 cycles every 90 days. For any pilot falling short of 10 cycles in 90 days, the pilot must re-take and pass the pilot qualification test. Pilots completing initial training are exempt from this 10/90 standard for the first 90 days following their initial training. Pilots not having completed at least 3 HEC missions within 12 months, must re-take the initial qualification course.

Project Planning

Prior to any class B HEC option, the helicopter operator should conduct an assessment of the proposed operations to determine the overall feasibility and associated risk of the proposed task. Consideration should be given to the following minimum categories:

- Type of work to be done
    - Energized vs de-energized
- Hazard identification and mitigation
- Use of Class B HEC as opposed to alternative methods
- Aircraft, equipment, and personnel required to complete the work

- Structure design, dimensions, age, and condition
- Landing zone placement as close to work site as possible
- Minimum approach distance (MAD)
- Consideration of a crewmember's exposure to:
    - Suspension in a harness
    - Wind and extreme temperatures
    - Class B HEC in the wire environment
- Pilot fatigue due to vertical reference positioning

Pre-work Briefing / Training

A pre-work briefing should be attended by all persons associated with the project and is intended to convey all critical information related to the work tasks. This briefing should focus on the project's broad scope and provide specific training related to:

- All items contained the project plaining
- Site specific safety plan
- Electrical clearances
- Job hazard analysis

Daily Tailboard Briefing

The daily tailboard should be attended by all persons involved in the work task for that particular day. The briefing should cover the previous day's events along with any observations, concerns and newly identified risks or hazards. Additionally, this briefing should cover:

- Defining the core operational and individual tasks for the day
- Identify specific hazards
- Discuss hazard and risk mitigation
- Communication issues
- Weather conditions and forecasts
    - Wind gusts, lighting, or other weather factors that could increase risk
- Minimum approach distance (MAD)
- Any revisions to the site-specific safety plan
- Universal "stop work" authority
- Pre-work reconnaissance flight
- PPE appropriate for the task
- Review key points of the Emergency Action Plan
- Daily allowable load calculation

Any tailboard briefing should be conducted upon any significant change in the daily operations or request for a new task which was not covered by the daily tailboard.

Personal Protective Equipment

Personal Protective Equipment (PPE) should be worn by all personnel conducting Class B HEC operations. PPE for electrical workers (crewmembers) should comply with Title 29 CFR, Part 1910/1926, and equivalent regulations in states with OSHA-approved plans.

PPE should consist of the following as required:

- Head protection (helmet or hard hat with three-point chin strap)
- Eye protection (goggles or helmet visor)
- Hearing protection
- Cotton, Flash Resistant (FR) or conducting clothing
- Gloves (Leather or Nomex)
- Boots (should provide adequate foot and ankle protection)
- Class III full body harness
- Safety lanyard with fall arrest
- Emergency floatation device (when operating over or near water)

Equipment Inspections

A visual inspection of all rigging components of the Class B HEC system should be conducted daily prior to any HEC operations. Equipment should be closely inspected for any signs of damage or wear that would deem a particular piece of equipment unserviceable. Additionally, periodic inspections should be conducted in accordance with the equipment manufacture's directives and instructions for continued serviceability. Any component that has any evidence of damage or excessive wear should be immediately taken out of service and replaced.

Secondary Safety Device

A Secondary Safety Device or Personal Safety Device (PSD) should be used to prevent the inadvertent release of the crewmember. Any secondary safety device shall have the ability to allow the pilot or qualified crew member to jettison the load. The purpose and discussion for the use of the PSD is covered by FAA InFo letter, dated 9/10/2012.

Class B HEC Lines

Lines used for Class B HEC require meticulous selection, care, inspection, and storage. All lines used for Class B HEC should:

- Be spliced by a certified individual or entity using the manufactures guidelines
- Be serialized and traceable
- Be labeled with a WLL (working load limit)
- Have a minimum breaking strength 10 times the working load limit
- Be non-metallic
- Be non-rotational
- Be sufficiently weighted to prevent the empty line from making contact with the tail rotor

Ropes equipped with any type of conductive cable or extension cord should not be used for Class B HEC operations.

Note: Contaminates and/or moisture on the Class B HEC line can increase the risk of conductivity.

Harness

Harnesses used for Class B HEC should be class 3, full body style harnesses with a D-ring for hookup, a dorsal D-ring for fall protection and other hookup provisions as necessary. For longer flights (usually more than 15 minutes), a harness with an integrated seat should be used to prevent adverse health consequences such as suspension trauma. Orthostatic intolerance and other suspension trauma can occur when suspected for long periods of time and should be addressed with proper harness selection and fit.

Newer, specially designed ergonomic harness, or harnesses, or harnesses with integrated seats which reduced suspension trauma.

A-Frame and Carabiner Attachments

If an A Frame and carabiner is utilized to conduct the Class B HEC line with the crewmembers harness, the A-Frame or attachment device should be ANSI Z359 rated with a dual action release gate.

Aircraft

The following aircraft related minimums shall be observed when conducting Class B HEC.

- The A/C performing the HEC mission must have sufficient power available to hover out of ground effect at all times during the flight
- The A/C must have power available verified each day through a documented power assurance check
- Under the conditions which an aircraft's allowable gross weight with a jettisonable load is greater than the internal gross weight limitation, the internal load limit should not be exceeded when performing Class B HEC. This is intended to provide an added marking of aircraft performance safety.

Aircraft Maintenance

An aircraft used for Class B HEC should be meticulously maintained in accordance with 14 CFR Parts 91 and 43 as well as the SRH's FAA approved maintenance program. SRH will ensure that the aircraft are being inspected daily in accordance with the AIP preflight procedures.

Landing Zones / Base of Operation

Landing Zones or Class B HEC base of operations should be located as close to the work area as practicable in order to limit the crew's time in suspension under the helicopter.